AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions of claims in the application:

Listing of Claims:

1. (Currently Amended) A system that navigates a virtual body within a 3D virtual workspace, the system comprising:

an input drive control system that monitors changes in input variables associated with actions of a user input device;

a workspace control system that provides a user with a viewing context comprising a position and orientation associated with states of a plurality of workspace variables, at least one of the workspace variables coupled with the input drive control system, such that a selection of the at least one workspace variables allows for a single input motion of the user input device to change the state of the at least one workspace variable and deselection of the at least one workspace variable changes the position and orientation of the viewing context, wherein the change takes place over time such that the user is made aware of the change in position and orientation of the viewing context, wherein deselection of the user input device causes the position and orientation of the virtual body to glide down to a location within a viewing frustum along a ground plane in the 3D virtual workspace; and

a travel control system that couples the at least one of the workspace variables to the input drive control system based on a navigation type, which comprises at least one of speed coupled flying, orbiting, object manipulation technique, ghost copy technique, possession navigation technique, inverse fog technique, inverse scaling technique, and ephemeral world compression.

2. (Cancelled)

3. (Original) The system of claim 1, the input variables comprising speed, position and selection data.

4. (Original) The system of claim 1, the plurality of workspace variables comprising object state, environment state and virtual body state.

5. (Currently Amended) The system of claim 1, the input variables comprising speed of the user input device and the at least one of the plurality of workspace variables comprising the state of the virtual body wherein the forward speed of the input device is coupled to the height and tilt of the virtual body such that the viewing context of the virtual body is continuously updated and moves from a local view to a global view of the 3D virtual workspace~~, wherein deselection of the user input device causes the position and orientation of the virtual body to glide down to a location within a viewing frustum along a ground plane in the 3D virtual workspace~~.

6. (Original) The system of claim 5, the location within a viewing frustum being a bottom of the viewing frustum.

7. (Original) The system of claim 5, the location within a viewing frustum being an object in the viewing frustum.

8. (Original) The system of claim 5, the height of the virtual body being limited by a ceiling within the 3D virtual workspace.

9. (Original) The system of claim 5, the input variables comprising speed, position and selection data and the plurality of workspace variables comprising object state and virtual body state wherein selection of an object animates the object to the center of the 3D virtual workspace, dragging the input device forward and backward moves the virtual body toward and away from the object, respectively, and dragging the input device left or right causes the virtual body to orbit around the object.

10. (Original) The system of claim 1, the at least one of the plurality of workspace variables being an object state, the input drive control system being coupled to the object state such that an object can be selected creating a copy of the object that is manipulated to a new position and

orientation in the 3D virtual workspace wherein the viewing context assumes the new position and orientation of the copy of the object with respect to the object upon deselection of the object.

11. (Original) The system of claim 1, the at least one of the plurality of workspace variables being an object state, the input drive control system being coupled to the object state such that an object in a first viewing context can be selected creating a copy of the object that is manipulated to a new position and orientation in the 3D virtual workspace creating a second viewing context with the new position and orientation.

12. (Original) The system of claim 11, wherein multiple copies and multiple viewing contexts can be created by manipulating multiple copies of the object to various positions and orientations, each copy being destroyed upon deselection of the object.

13. (Original) The system of claim 1, the at least one of the plurality of workspace variables being an object state, the input drive control system being coupled to the object state such that an object in a viewing context can be selected wherein the viewing context is adjusted to the position and orientation of the object, thereby, possessing the object.

14. (Original) The system of claim 1, the at least one of the plurality of workspace variables being an object state and a virtual body state, the input drive control system being coupled to the object state and the virtual body state such that the state of at least one of objects within and objects outside a radius centered on a virtual body is changed to eliminate occlusions within the viewing context.

15. (Original) The system of claim 14, the state of the objects within the radius being changed to a transparent state.

16. (Original) The system of claim 14, the state of the objects within the radius being changed to a reduced size state.

17. (Original) The system of claim 16, the reduced size state of the object depending on the distance of the object from the virtual body.

18. (Original) The system of claim 14, the state of the objects outside the radius being changed to an enlarged size state.

19. (Original) The system of claim 18, the enlarged size state of the object depending on the distance of the object from the virtual body.

20. (Original) The system of claim 14, the radius being fixed and the virtual body state being movable through the 3D virtual workspace.

21. (Original) The system of claim 14, the radius being adjustable and the virtual body state being fixed in the 3D virtual workspace.

22. (Original) The system of claim 1, the at least one of the plurality of workspace variables being an environment state and a virtual body state, the input drive control system being coupled to the environment state and the virtual body state such that selection of the environment causes a ground plane of the environment to be compressed radially around a virtual body, the virtual body being navigable within the compressed ground plane.

23. (Currently Amended) A processor controlled display system for displaying a virtual 3D workspace comprising:

a processor;

a user input device coupled to the processor, the user input device providing signals indicating actions and requests of a system user to the processor;

a display device coupled to the processor, the display device being operable to displaying a 3D virtual workspace based on instructions from the processor; and

a memory having executable instructions stored therein, the processor in response to the instructions executes an animation loop routine which periodically calls one or more workspace routines that provide a viewing context of the 3D virtual workspace on the display device, the

viewing context having an initial position and orientation associated with the states of a plurality of workspace variables, at least one of the plurality of workspace variables integrated with the user input device based on a navigation type that comprises at least one of speed coupled flying, orbiting, object manipulation technique, ghost copy technique, possession navigation technique, inverse fog technique, inverse scaling technique, and ephemeral world compression, such that a selection of the at least one workspace variables allows for a single input motion of the user input device to change the state of the at least one workspace variable and deselection of the at least one workspace variable changes the position and orientation of the viewing context, wherein the change takes place over time such that the user is made aware of the change in position and orientation of the viewing context of the 3D virtual workspace on the display device, wherein slowing down of the user input device in a forward direction causes the position and orientation of the virtual body to glide down to a location within a viewing frustum along a ground plane in the 3D virtual workspace.

24. (Cancelled)

25. (Currently Amended) The system of claim 23, the at least one of a plurality of workspace variables being the state of a virtual body, the speed of the user input device being coupled to the height and tilt of the virtual body within the 3D virtual workspace such that display is provided with a viewing context from the virtual body that moves from a local view to a global view of the 3D virtual workspace as the speed of the user input device is increased~~, wherein slowing down of the user input device in the forward direction causes the position and orientation of the virtual body to glide down to a location within a viewing frustum along a ground plane in the 3D virtual workspace~~.

26. (Original) The system of claim 25, the location within a viewing frustum being a bottom of the viewing frustum.

27. (Original) The system of claim 25, the location within a viewing frustum being an object in the viewing frustum.

28. (Original) The system of claim 25, the height of the virtual body being limited by a ceiling within the 3D virtual workspace.

29. (Original) The system of claim 25, the plurality of workspace variables comprising object state and virtual body state wherein selection of an object within the 3D virtual workspace with the user input device animates the object to a viewing context in the center of the 3D virtual workspace, dragging the input device forward and backward moves the viewing context from the virtual body toward and away from the object, respectively, and dragging the input device left or right orbits the viewing context from the virtual body around the object.

30. (Previously presented) The system of claim 23, the at least one of the plurality of workspace variables being an object state, such that selecting an object within the 3D virtual workspace with the user input device creates a copy of the object that can be manipulated to a new position and orientation in the 3D virtual workspace wherein the viewing context assumes the new position and orientation of the copy of the object with respect to the object upon deselection of the object.

31. (Previously presented) The system of claim 23, the at least one of the plurality of workspace variables being an object state, such that selecting an object within the 3D virtual workspace with the user input device creates a copy of the object that can be manipulated to a new position and orientation in the 3D virtual workspace creating a second viewing context with the new position and orientation.

32. (Original) The system of claim 31, wherein multiple copies and multiple viewing contexts can be created by manipulating multiple copies of the object to various positions and orientations, each copy being destroyed upon deselection of the object.

33. (Previously presented) The system of claim 23, the at least one of the plurality of workspace variables being an object state, such that an object within the 3D virtual workspace can be selected by the user input device providing a new viewing context having the position and orientation of the selected object, thereby, possessing the object.

34. (Previously presented) The system of claim 23, the at least one of the plurality of workspace variables being an object state and a virtual body state, such that the state of at least one of objects within and objects outside a radius centered on a virtual body is changed to eliminate occlusions within the viewing context.

35. (Original) The system of claim 34, the state of the objects within the radius being changed to a transparent state.

36. (Original) The system of claim 34, the state of the objects within the radius being changed to a reduced size state.

37. (Original) The system of claim 36, the reduced size state of an object depending on the distance of the object from the virtual body.

38. (Original) The system of claim 34, the state of the objects outside the radius being changed to an enlarged size state.

39. (Original) The system of claim 38, the enlarged size state of an object depending on the distance of the object from the virtual body.

40. (Original) The system of claim 34, the radius being fixed and the virtual body state being movable through the 3D virtual workspace.

41. (Original) The system of claim 34, the radius being adjustable and the virtual body state being fixed in the 3D virtual workspace.

42. (Previously presented) The system of claim 23, the at least one of the plurality of workspace variables being an environment state and a virtual body state, such that selection of the environment of the 3D virtual workspace causes a ground plane of the 3D virtual workspace

to be compressed radially around a viewing context of a virtual body, the virtual body being navigable within the compressed ground plane of the 3D virtual workspace.

43. (Currently Amended) A computer implemented method for implementing a 3D virtual environment comprising;

displaying a plurality of virtual 3D objects within a 3D virtual environment, the 3D virtual environment having an initial viewing context with an initial position and orientation from a virtual body;

determining a navigation type, which comprises at least one of speed coupled flying, orbiting, object manipulation technique, ghost copy technique, possession navigation technique, inverse fog technique, inverse scaling technique, and ephemeral world compression;

coupling signals associated with actions of a user input device to a state of at least one workspace variable based on the navigation type, the at least one workspace variable being at least one of the plurality of virtual 3D objects, the 3D virtual environment and the virtual body;

selecting the at least one workspace variable;

changing the state of the at least one workspace variable in response to actions of the user input device, wherein slowing down a forward speed of the user input device causes the position and orientation of the viewing context from the virtual body to glide down to the bottom of a viewing frustum along a ground plane in the 3D virtual environment;

deselecting at least one workspace variable; and

changing the position and orientation over time of the viewing context of the viewing context based on the changing of the state of the at least one workspace variable.

44. (Cancelled)

45. (Currently Amended) The method of claim 43, wherein coupling signals associated with actions of a user input device to a state of at least one workspace comprising coupling signals associated with actions of a user input device to the state of the virtual body, the forward speed of the user input device being coupled to the height and tilt of the virtual body within the 3D virtual environment such that position and orientation of the viewing context from the virtual body moves from a local view to a global view of the 3D virtual environment as the speed of the user input device is increased~~, wherein slowing down the forward speed of the user input device causes the position and orientation of the viewing context from the virtual body to glide down to the bottom of a viewing frustum along a ground plane in the 3D virtual environment~~.

46. (Original) The method of claim 45, the location within a viewing frustum being a bottom of the viewing frustum.

47. (Original) The method of claim 45, the location within a viewing frustum being an object in the viewing frustum.

48. (Original) The method of claim 45, the height of the viewing context being limited by a ceiling within the 3D virtual environment.

49. (Original) The method of claim 43, wherein coupling signals associated with actions of a user input device to a state of at least one workspace comprises coupling signals associated with actions of a user input device to a state of an object and a state of the virtual body wherein selection of an object within the 3D virtual environment animates the object to a viewing context in the center of the 3D virtual environment, dragging the input device forward and backward moves the viewing context from the virtual body toward and away from the object, respectively, and dragging the input device left or right orbits the viewing context from the virtual body around the object.

50. (Original) The method of claim 43, wherein coupling signals associated with actions of a user input device to a state of at least one workspace comprises coupling signals associated with actions of a user input device to a state of an object, such that selecting the object with the user

input device creates a copy of the object that can be manipulated to a new position and orientation in the 3D virtual environment wherein the viewing context assumes the new position and orientation of the copy of the object with respect to the object upon deselection of the object.

51. (Original) The method of claim 43, wherein coupling signals associated with actions of a user input device to a state of at least one workspace comprises coupling signals associated with actions of a user input device to a state of an object, such that selecting an object with the user input device creates a copy of the object that can be manipulated to a new position and orientation in the 3D virtual environment creating a second viewing context with the new position and orientation.

52. (Original) The method of claim 51, wherein multiple copies and multiple viewing contexts can be created by manipulating multiple copies of the object to various positions and orientations, each copy being destroyed upon deselection of the object.

53. (Original) The method of claim 43, wherein coupling signals associated with actions of a user input device to a state of at least one workspace comprises coupling signals associated with actions of a user input device to a state of an object, such that an object within the 3D virtual environment can be selected by the user input device providing a new viewing context having the position and orientation of the selected object, thereby, possessing the object.

54. (Original) The method of claim 43, wherein coupling signals associated with actions of a user input device to a state of at least one workspace comprises coupling signals associated with actions of a user input device to a state of at least one object and a state of the virtual body, such that the state of at least one of objects within and objects outside a radius centered on a virtual body is changed to eliminate occlusions within the viewing context.

55. (Original) The method of claim 54, the state of the objects within the radius being changed to a transparent state.

56. (Original) The method of claim 54, the state of the objects within the radius being changed to a reduced size state.

57. (Original) The method of claim 56, the reduced size state of an object depending on the distance of the object from the virtual body.

58. (Original) The method of claim 54, the state of the objects outside the radius being changed to an enlarged size state.

59. (Original) The method of claim 58, the enlarged size state of an object depending on the distance of the object from the virtual body.

60. (Original) The method of claim 54, the radius being fixed and the virtual body state being movable through the 3D virtual environment.

61. (Original) The method of claim 54, the radius being adjustable and the virtual body state being fixed in the 3D virtual environment.

62. (Original) The method of claim 43, wherein coupling signals associated with actions of a user input device to a state of at least one workspace comprises coupling signals associated with actions of a user input device to a state of the 3D virtual environment and a state of the virtual body, such that selection of the environment causes a ground plane of the 3D virtual environment to be compressed radially around a viewing context of a virtual body, the virtual body being navigable within the compressed ground plane of the 3D virtual environment.

63. (Original) The method of claim 43, wherein changing at least one of the position and orientation of the viewing context based on the changing of the state of the at least one workspace variable being accomplished in a single input motion of the user input device.

64. (Currently Amended) A system that navigates a virtual body within a 3D virtual workspace for identifying objects within the 3D virtual workspace, the system comprising;

means for displaying a 3D virtual workspace having a plurality of virtual 3D objects and a viewing context from a virtual body, the viewing context having an initial position and orientation;

means for coupling signals associated with actions of a user input device to a state of at least one workspace variable based on a navigation type that comprises at least one of speed coupled flying, orbiting, object manipulation technique, ghost copy technique, possession navigation technique, inverse fog technique, inverse scaling technique, and ephemeral world compression;

means for changing the state of the at least one workspace variable in response to actions of the user input device, wherein deselection of the user input device causes the position and orientation of the virtual body to glide down to a location within a viewing frustum along a ground plane in the 3D virtual workspace; and

means for changing the position and orientation of the viewing context over time based on the changes of the state of the at least one workspace variable.

65. (Original) The system of claim 64, the means for coupling signals associated with actions of a user input device to a state of at least one workspace variable coupling forward speed of the user input device to the height and tilt of the virtual body within the 3D virtual workspace.

66. (Original) The system of claim 64, the means for coupling signals associated with actions of a user input device to a state of at least one workspace variable further comprising means for orbiting a selected object.

67. (Original) The system of claim 64, the means for coupling signals associated with actions of a user input device to a state of at least one workspace variable further comprising means for creating a copy of a selected object that can be manipulated to a new position and orientation in the 3D virtual workspace wherein the viewing context assumes the new position and orientation of the copy of the selected object with respect to the object upon deselection of the object.

68. (Original) The system of claim 64, the means for coupling signals associated with actions of a user input device to a state of at least one workspace variable further comprising means for

creating at least one copy of the object that can be manipulated to a new position and orientation in the 3D virtual workspace creating at least one additional viewing context with the new position and orientation.

69. (Original) The system of claim 64, the means for coupling signals associated with actions of a user input device to a state of at least one workspace variable further comprising means for possessing an object.

70. (Original) The system of claim 64, the means for coupling signals associated with actions of a user input device to a state of at least one workspace variable further comprising means for eliminating occlusions within the viewing context.

71. (Original) The system of claim 64, the means for coupling signals associated with actions of a user input device to a state of at least one workspace variable further comprising means for compressing a ground plane of the 3D virtual workspace around a viewing context of a virtual body.

72. (Currently Amended) A computer-readable medium having computer-executable for performing the steps comprising;

displaying a 3D virtual workspace having a plurality of virtual 3D objects and a viewing context from a virtual body, the viewing context having an initial position and orientation;

coupling signals associated with actions of a user input device to a state of at least one workspace variable based on a navigation type that comprises at least one of speed coupled flying, orbiting, object manipulation technique, ghost copy technique, possession navigation technique, inverse fog technique, inverse scaling technique, and ephemeral world compression;

changing the state of the at least one workspace variable in response to actions of the user input device, wherein deselection of the user input device causes the position and orientation of the virtual body to glide down to a location within a viewing frustum along a ground plane in the 3D virtual workspace; and

changing the position and orientation of the viewing context over time based on the changes of the state of the at least one workspace variable.

73. (Currently Amended) A system that navigates a virtual body within a 3D virtual workspace, the system comprising:

an input drive control system that receives changes to a speed of a user input device;

a workspace control system that maintains a viewing context germane to a state of the virtual body that comprises a position and orientation, wherein slowing down a forward speed of the user input device causes the position and orientation of the viewing context from the virtual body to glide down to the bottom of a viewing frustum along a ground plane in the 3D virtual environment; and

a speed coupled flying navigation component that configures height and tilt of the virtual body based on the forward speed of the input device, such that an increase in speed increases the height and tilt of the virtual body and a decrease in speed decreases the height and tilt of the virtual body.

74. (Currently Amended) A computer implemented object inspection method for a 3D virtual environment comprising:

displaying a plurality of virtual three dimensional objects within the 3D virtual environment based on initial position and orientation of the objects;

selecting at least one of the plurality of objects, which creates a copy of the at least one selected objects;

manipulating the copy to a new position and orientation in the virtual environment with a user input device, wherein deselection of the user input device causes the position and orientation of the virtual body to glide down to a location within a viewing frustum along a ground plane in the 3D virtual workspace;

deselecting the at least one of the plurality of objects; and

animating the change in position and orientation of the objects.

75. (Currently Amended) A computer-readable medium having computer-executable for performing the steps comprising:

displaying a viewing context of a 3D virtual workspace based on an initial state of a plurality of virtual 3D objects and an initial state of a virtual body;

selecting at least one of the plurality of objects; and

changing the states of the selected objects and the virtual body with the user input device such that dragging the input device forward and backward moves the viewing context from the virtual body toward and away from the object, respectively, and dragging the input device left or right orbits the viewing context from the virtual body around the object, wherein deselection of the user input device causes the position and orientation of the virtual body to glide down to a location within a viewing frustum along a ground plane in the 3D virtual workspace.

76. (Currently Amended) A system that manipulates virtual objects in a 3D virtual workspace comprising:

an input drive control system that accommodates changes in input variables associated with actions of a user input device;

a workspace control system that maintains a viewing context that corresponds to a state of a 3D virtual object that comprises a position and orientation, wherein deselection of the user input device causes the position and orientation of the virtual body to glide down to a location within a viewing frustum along a ground plane in the 3D virtual workspace; and

a ghost copy navigation component that simultaneously displays a modified viewing context that comprises a plurality of copies of the object in disparate positions and orientations, each copy manipulated to the position and orientation by the input device.

77. (Currently Amended) A computer implemented navigation method for a 3D virtual environment comprising:

displaying an initial viewing context of the 3D virtual environment comprising a plurality of virtual 3D objects, each object possesses an object state that comprises a position and orientation;

selecting at least one of the plurality of objects with a user input device, wherein deselection of the user input device causes the position and orientation of the virtual body to glide down to a location within a viewing frustum along a ground plane in the 3D virtual workspace; and

displaying a second viewing context of the 3D virtual environment from the position and orientation of the selected object.

78. (Currently Amended) A system that inspects a 3D virtual workspace comprising:

means for displaying an initial viewing context of the 3D virtual workspace that comprises a plurality of virtual 3D objects and a virtual body;

means for reducing occlusions within the viewing context by transforming objects within a radius of a sphere located on the virtual body employing at least one of the inverse fog technique and the inverse scaling technique;

means for compressing a ground plane of the 3D virtual workspace radially around the virtual body; and

means for displaying the radially compressed 3D virtual workspace including objects located behind the virtual body.

79. (Previously presented) A system that inspects a 3D virtual workspace comprising:

means for displaying an initial viewing context of the 3D virtual workspace that comprises a plurality of virtual 3D objects and a virtual body;

means for controlling a radius of a sphere centered on the virtual body; and

means for reducing occlusions within the viewing context by transforming objects within the radius employing at least one of the inverse fog technique and the inverse scaling technique.